

## VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a major, municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260 et seq. The discharge results from the operation of a municipal wastewater treatment facility. This permit action includes revised effluent limitations and special conditions, and updates the formatting of portions of the permit.

1. Facility Name and Address: Proctors Creek WWTP  
Chesterfield County, Department of Utilities  
1200 Coxendale Rd.  
Chester, VA 23836
2. SIC Code: 4952 Sewerage Systems
3. Permit No. VA0060194      Permit Expiration Date: June 19, 2010
4. Owner Contact:  
Name: Scott Smedley  
Title: Plant Manager  
Telephone No.: 804/768-7557  
Address: 1200 Coxendale Rd., Chester, VA 23836
5. Application Complete Date: December 29, 2009  
Permit Drafted By: Virginia R. E. Kelly      Date: January 25, 2010; revised February 9, 2010,  
May 5, 2010, June 4, 2010, July 19, 2010, July  
28, 2010  
DEQ Regional Office: Piedmont Regional Office  
Reviewed By: Emilee Carpenter      Date: January 28, 2010  
Curt Linderman      Date: May 4, 2010  
Central Office      Date: June 9, 2010  
Kyle Winter      Date: June 4, 2010
6. Receiving Stream:  

Outfall 001  
Name: James River  
River Mile: 2-JMS097.94  
Basin: James River (Lower)  
Subbasin: N/A  
Section: 1  
Class: II  
Special Standards: bb  
1-Day, 10-Year Low Flow: 446 MGD\*  
7-Day, 10-Year Low Flow: 501 MGD\*  
30-Day, 5-Year Low Flow: 712 MGD\*  
30-Day, 10-Year Low Flow: 641 MGD\*  
Harmonic Mean Flow: 2109 MGD\*  
Tidal? Yes  
On 303(d) list? Yes

\* Fresh water flows at fall line. These flows are presented for information only. Pollutant loading mixing analyses are based on tidal default mixing ratios as discussed in #17 below.

7. Operator License Requirements: The recommended attendance hours by a licensed operator and the minimum daily hours that the treatment works should be manned by operating staff are contained in the Sewage Collection and Treatment Regulations (SCAT) 9 VAC 25-790 et seq. A Class I licensed operator is required for the facility.
8. Reliability Class: Reliability is a measurement of the ability of a component or system to perform its designated function without failure or interruption of service. The reliability classification is based on the water quality and public health consequences of a component or system failure. The permittee is required to maintain Class I Reliability for the existing facility.
9. Permit Characterization:  
 (X) Existing Discharge (X) Municipal  
 (X) POTW SIC Code(s): 4952  
 (X) Reissuance (X) Discharge to 303(d) Listed Segment  
 (X) Water Quality Limited (X) Whole Effluent Toxicity Program Required
10. Wastewater Flow and Treatment: Table 1

Outfall Number	Wastewater Source	Treatment	Flow
001	Chesterfield County (and 29 Industrial contributors)	Screening, comminution, aerated grit removal, primary clarification, biological nutrient removal, secondary clarification, tertiary gravity filters, chlorination, dechlorination, re-aeration via step cascade; for sludge: dissolved air floatation, anaerobic digestion, gravity thickening, and land application	27.0 MGD design capacity

See **Attachment A** for a facility diagram.

11. Sludge Disposal: Chesterfield County currently contracts Nutri-Blend, Inc. to land-apply the sludge generated by the facility (Pollutant Concentration Sewage Sludge). The sludge meets Class B pathogen reduction. Nutri-Blend is currently operating under a BUR permit.
12. Discharge Location Description: This facility discharges to the James River.  
Name of USGS topo map: Drewry's Bluff (99B) (See **Attachment B**)
13. Material Storage: The POTW employs and stores a variety of chemicals in the treatment process. Some regularly utilized and stored chemicals include alum, polymer, magnesium hydroxide, sodium hypochlorite, and sodium bisulfite. These chemicals are stored in buildings with appropriate spill containment. The dewatered, digested sludge is stored on a curbed concrete pad.
14. Ambient Water Quality Information: Ambient water quality data from an upstream station at river mile 2-JMS099.30 was used in this analysis for Outfall 001 (James River discharge); this station, located at Buoy 157, approximately 1.4 miles upstream of the outfall was selected due to the close proximity of the discharge site. See **Attachment C**.

Additionally, the high flow months from the Richmond-Crater Water Quality Management Plan were applied to the permit limitations (as opposed to the high flow months indicated in the Flow Frequency Memorandum). The high flow months from the 208 Plan, which take into

consideration temperature and flow, are believed to be more appropriate than the Flow Frequency projected high flow months which only account for flow variations.

15. Antidegradation Review and Comments: The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect those uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with a Tier determination. The receiving stream, James River, is determined to be a Tier 1 waterbody. The Richmond-Crater Water Quality Management Plan fully allocates BOD and ammonia to multiple dischargers in the segment for the purpose of limiting adverse effects to both dissolved oxygen and ammonia ambient concentrations. Also see TMDL discussion in # 28 below.

16. Site Inspection: June 15, 2010. See **Attachment D**.

17. Effluent Screening:

Effluent Data

See **Attachment E** for effluent data submitted with the permit application and obtained from DMRs and other submitted reports.

Modeling

This facility does not have a site-specific mixing model to be used in evaluating toxic parameters. In recent permit reissuances, freshwater inflow values have been utilized to estimate the amount of mixing in the receiving stream at the point of discharge. However, this reissuance uses the tidal default mixing ratios, expressed as total parts to effluent parts, of 2:1 for acute analyses and 50:1 for chronic evaluations. This change in modeling approaches stems from efforts to be more consistent with the modeling techniques used in nearby facilities (which employ either site-specific models or the tidal default ratios). As demonstrated below, the use of the tidal defaults, in this case, is less stringent than the 2005 modeling approach; however, antibacksliding prohibits the relaxation of permit limitations in this situation.

<b>Modeling Criteria</b>	<b>Design Flow</b>	<b>Adjusted Low Flow*</b>	<b>% Mix Allowed*</b>	<b>2005 Stream Flow Used for Dilution</b>	<b>2005 Mixing Ratio</b>	<b>2010 Tidal Default Mixing Ratio</b>
Acute	27 MGD	426 MGD	0.68%	2.90 MGD	1.1: 1	2: 1
Chronic	27 MGD	499 MGD	37.2%	186 MGD	7.9: 1	50: 1

\*From the 2005 fact sheet; included in **Attachment F**.

DEQ is aware that the actual chronic mix is less than 50:1, but preliminary determinations indicate that changes in the chronic mixing have no effect on the limits as proposed in this reissuance. During the permit cycle, should an updated mixing model (such as CORMIX) become available, that model would be evaluated in the up-coming permit reissuance.

To achieve that mixing condition in MSTRANTI, the design flow was set to 27 MGD, the 1Q10 stream flow was set to 27 MGD, and the 7Q10 stream flow was set to 1323 MGD, as established using the equation below:

$$\frac{1 \text{ part Effluent}}{2 \text{ parts Total}} = \frac{Q \text{ design}}{Q \text{ stream} + Q \text{ design}} \quad \text{Eqn (1)}$$

$$\frac{1 \text{ part Effluent}}{50 \text{ parts Total}} = \frac{Q \text{ design}}{Q \text{ stream} + Q \text{ design}} \quad \text{Eqn (2)}$$

The tidal default values provide dilution ratios only for 1Q10 and 7Q10 scenarios; the 30Q5, 30Q10, and harmonic mean flow frequencies for tidal discharges are not defined. To provide a conservative analysis, these undefined values were set equivalent to that of the chronic flow frequency.

Consistent with all nearby major facilities, a different approach was utilized to evaluate conventional permit limitations. This reissuance continues to use the Richmond-Crater Water Quality Management Plan (RCWQMP), which was based on a model using freshwater inflow values, as a basis for cBOD<sub>5</sub>, TSS, and some ammonia permit limitations.

#### Reasonable Potential Evaluation

A review of the effluent data submitted with the reissuance application indicated a need to examine the potential effects of radionuclides, chloroform, dichlorobromomethane, bis(2-ethylhexyl)phthalate (also known as Di-2-ethylhexyl phthalate), zinc, chloride, and hydrogen sulfide. All other parameters were considered absent for the purposes of the reasonable potential analyses. Evaluations for chloride, hydrogen sulfide, and zinc are included in Attachment F.

Attachment F also presents the evaluation of the need for ammonia and TRC limitations in the draft permit. Included in Attachment F are MSTRANTI input data sources, MSTRANTI printout with WLAs, and STATS.exe analyses for the appropriate parameters.

While the facility reported a quantifiable value for total recoverable copper, the dissolved copper sample was less than the quantification level, and no further reasonable potential analysis was performed. Similarly, the facility reported a quantifiable value for total cyanide but a free cyanide value less than the quantification level; as the WQS is for free cyanide, no further reasonable potential analysis was necessary.

The Human Health WLAs were established, using MSTRANTI, based on the applicable human health standards. A comparison of the measured concentration to the corresponding human health standard is tabulated below.

Parameter	Human Health Standard (µg/L)	WLA <sub>HH</sub> (µg/L)	Concentration at Outfall 001 (µg/L)
Chloroform	11,000	550,000	<5, 20, 10
Dichlorobromomethane	170	8,500	<5, <5, 10
Bis(2-ethylhexyl)phthalate	22	1,100	<5, 15, 32
Zinc	26,000	1,300,000	23

As indicated above, zinc, chloroform, dichlorobromomethane, and chlorodibromomethane do not present a reasonable potential to cause or contribute to a water quality standard violation.

Parameter	Human Health Standard	WLA <sub>HH, PWS</sub>	Concentration at Outfall 001
*Beta Particle & Photon Activity	4 mrem/yr	200 mrem/yr	10.3 pCi/L
*Uranium	30 µg/L	1,500 µg/L	<0.6 pCi/L ≈ <0.90 µg/L
*Gross Alpha	15 pCi/L	750 pCi/L	<1.3 pCi/L
*+Combined Radium 226 & 228	5 pCi/L	250 pCi/L	1.05 pCi/L

\* NOTE: The Human Health Standard for this parameter is only applicable in Public Water Supply (PWS) designated waters.

+ The permittee provided separate analytical results for Radium 226 and Radium 228 which were 0.5 pCi/L and <1.1 pCi/L, respectively; using half the quantification level of Rd-228 as a reportable value, these two results were summed to establish the combined radium result.

The WLA<sub>HH, PWS</sub> were derived using the following calculation:

$$WLA = \frac{WQS (Q_{stream} + Q_{design})}{Q_{design}} \quad \text{Eqn (3)}$$

where WLA = WLA<sub>HH, PWS</sub>

WQS = Human Health Standard as defined in the table above

Q stream = total stream parts, 1323 MGD (see discussion above)

Q design = 27 MGD.

In the application, the values reported for Beta Particle and Photon Activity are in units of activity (i.e. pCi/L) whereas the applicable water quality standard is an exposure in terms of mrem/yr. The EPA has established this same standard for community potable water systems. EPA guidance states that compliance with the potable water standard may be assumed if the average annual concentration of Beta Particle and Photon Activity is less than 50 pCi/L (Radionuclides in Drinking Water: A Small Entity Compliance Guide. EPA 815-R-02-001, February 2002.; <http://www.epa.gov/safewater/radionuclides/compliancehelp.html>). Consequently, the reported concentrations of Beta Particle and Photon Activity are considered to meet the applicable water quality standards.

The application reported uranium concentration in terms of activity, pCi/L whereas the standard is in terms of mass, µg/L. EPA has suggested conversion factors for activity to mass ranging from 0.67 to 1.5 pCi/µg (USEPA 2000. National Primary Drinking Water Regulations; Final Rule 65 FR 236; December 7, 2000.). To provide the most conservative estimate of mass-based concentration, the 0.67 pCi/µg conversion factor was used, resulting in an estimated <0.90 µg/L Uranium.

As indicated above, these parameters do not present a reasonable potential to cause or contribute to a water quality standard violation.

18. Effluent Limitation Development: Table 2: Outfall 001

PARAMETER		BASIS FOR LIMITS	DISCHARGE LIMITS					
			MO AVG		WE AVG		MIN	MAX
Flow (MGD)		NA	NL – monitoring only				NA	NL
pH (standard units)		2	NA		NA		6.0 S.U.	9.0 S.U.
cBOD <sub>5</sub>	June – October	4	7 mg/L	726 kg/d	11 mg/L	1090 kg/d	NA	NA
	November – May	4	11 mg/L	1090 kg/d	16 mg/L	1635 kg/d	NA	NA
Total Suspended Solids (TSS)	June – October	3	7.1 mg/L	726 kg/d	11 mg/L	1090 kg/d	NA	NA
	November – May	3	11 mg/L	1090 kg/d	16 mg/L	1635 kg/d	NA	NA
Ammonia as N	June – October	4	4.26 mg/L	435 kg/d	5.78 mg/L	583 kg/d	NA	NA
	November – May	4	6.22 mg/L	635 kg/d	8.55 mg/L	869 kg/d	NA	NA

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS				
		MO AVG		WE AVG	MIN	MAX
Total Phosphorus (as P)	5	2.0 mg/L	NL kg/d	NA	NA	NA
Total Nitrogen – Year-to-Date (upgrade only)	5	NL		NA	NA	NA
Total Nitrogen – Annual Average (upgrade only)	5	5.8 mg/L		NA	NA	NA
Dissolved Oxygen	3	NA		NA	6.0 mg/L	NA
Total Residual Chlorine (TRC)	1	10 µg/L		13 µg/L	NA	NA
*TRC Contact (Parameter 157)	3	NA		NA	1.0 mg/L	NA
*TRC Contact (Parameter 213)	3	NA		NA	0.60 mg/L	NA
<i>E.coli</i>	2	126 N/100 mL (geometric mean)		NA	NA	NA

1. Water Quality Based Effluent Limitation
2. Water Quality Standards
3. Best Engineering Judgment (BEJ)
4. Richmond Crater Water Quality Management Plan
5. Nutrient Regulations and DEQ Related Guidance
- \* Samples are taken prior to dechlorination.

#### Conventional Pollutants and Nutrients

As no changes have occurred in the treatment facility, the cBOD<sub>5</sub> load limitations remain based on the Richmond Crater Interim Water Quality Management Plan from 1989, the 2010 table, and the corresponding concentration limitations were calculated using the RCWQMP waste load allocations and a design flow of 27.0 MGD; the 208 Plan is included in **Attachment G**. The TSS limitations were established using the cBOD<sub>5</sub> load limitations as a guideline and Best Engineering Judgment (BEJ) as a basis.

The 85% removal clause for influent cBOD<sub>5</sub> and TSS was not included in this permit. 40 CFR 133.105 associates a secondary treatment limitation of 30 mg/L with the minimum 85% removal requirement. It can be presumed that if a facility meets a limit more stringent than secondary treatment standards, then the intent of the 85% removal clause is being met. Based on the effluent flows reported and recent inspection reports, Inflow and Infiltration (I&I) has not been of concern at this facility. This special condition has not been included in many permits which have conventional permit limitations more restrictive than required by secondary treatment standards.

Several of the cBOD<sub>5</sub> limitations were revised to become in accordance with the RCWQMP Loading Limitations; in order to do so, load calculations required rounding down. Per the plan, a summer load of 1602 lb/d and a winter load of 2403 lb/d were allotted. The calculations were as follows:

#### *June – October, Monthly Average*

$$1602 \text{ lb/d} \times 0.4536 \text{ kg/lb} = 726.667 \text{ kg/d} \approx 726 \text{ kg/d}$$

$$\frac{1602 \text{ lb/d} \times 0.4536 \text{ kg/lb}}{27 \text{ MGD} \times 3.785 \text{ L/gal}} = 7.11 \text{ mg/L} \approx 7 \text{ mg/L}$$

#### *November - May, Monthly Average*

$$2403 \text{ lb/d} \times 0.4536 \text{ kg/lb} = 1090 \text{ kg/d}$$

$$\frac{2403 \text{ lb/d} \times 0.4536 \text{ kg/lb}}{27 \text{ MGD} \times 3.785 \text{ L/gal}} = 10.66 \text{ mg/L} \approx 11 \text{ mg/L}$$

Guidance Memorandum 06-2016, Significant Figures for DMRs, was not applied to cBOD<sub>5</sub> and TSS loading limitations; these limitations were written as expressed in the governing regulation (the Richmond Crater Water Quality Management Plan). The concentration limitations for these parameters were based on GM06-2016 (taking into consideration the requirements of the RCWQMP for cBOD<sub>5</sub>).

All nutrient parameter limitations and associated monitoring were revised or included in accordance with the applicable guidance memorandum (Guidance Memorandum 07-2008, Amendment 2).

Part I.A.2 of the permit contains a tier for nutrients. The permit was tiered with respect to TN Annual Average Concentration limitations to allow for the issuance of a CTO for the Integrated Fixed Film Activated Sludge (IFAS) system which is projected to be installed during this permit cycle. This addition negates the need to modify the permit to include the appropriate nutrient limitations once the CTO for the upgrade is granted. The numeric limitations for TN annual average concentrations were selected based on summary data submitted in the Preliminary Engineering Report (PER) (see **Attachment H**) and to be consistent with the Falling Creek VPDES Permit (VA0024996).

Monitoring and reporting requirements for the individual components of the nutrients (i.e. TKN, NO<sub>3</sub>-NO<sub>2</sub>, orthophosphate, etc) as well as the monthly average concentrations for total nitrogen were not included as these parameters are already reported on the nutrient general permit DMR. However, TN year-to-date and annual average concentration reporting requirements were included in the individual permit as these calculations are not performed or reported on the nutrient general permit DMR.

#### Dissolved Oxygen (DO)

The WQS (9 VAC 25-260-185.A) establish minimum DO concentrations of equal to or greater than 5 mg/L (instantaneous minimum) and equal to or greater than 6 mg/L (7-day mean) for migratory fish spawning and nursery; these WQS are applicable February 1 through May 31. The open water DO WQS are applicable year round and require a 30-day mean equal to or greater than 5.5 mg/L, a 7-day mean equal to or greater than 4 mg/L, and an instantaneous minimum of equal to or greater than 4.3 mg/L. The 2005 permit required a minimum DO of 5.9 mg/L based on the Richmond Crater plan. Using BEJ, the DO effluent limits were increased to be no less than the most stringent ambient water quality standard (the 6.0 mg/L minimum weekly average for the migratory fish spawning and nursery designated use). In order to minimize reporting requirements, the permit was written with one, most controlling, permit limitation. Accordingly, a minimum DO limitation of 6.0 mg/L was included in the draft permit.

#### Ammonia and TRC

See Attachment F for further discussion related to the inclusion of monitoring and/or limitations for these parameters.

Mass loading limitations for ammonia were retained with this reissuance based on the inclusion of monthly average loading limitations in the RCWQMP. The weekly average mass loading ammonia limitations were retained from the 2005 permit to avoid anti-backsliding concerns.

GM06-2016 states that limits should be expressed in the same number of significant digits as the underlying standard or modeling basis. The RCWQMP June- October load is written as three significant digits whereas the November- May load is expressed as four. Converting the two loads into concentrations yields a monthly average limitation of 4.26 mg/L and a weekly average limitation of 6.222 mg/L. However, the analytical analysis for ammonia is not capable of reporting to the thousandth's place (0.001 mg/L); accordingly, the weekly average limitation was written to only three significant digits.

### Monitoring Frequencies

Sampling frequencies for flow, pH, and *E. coli* were selected based on the 2010 permit manual recommendations. Ammonia, cBOD<sub>5</sub>, and DO qualified for reduced monitoring frequencies (See Attachment K and Item #27 below). As per the June 2003 Water Permit Managers' Meeting Minutes, the baseline monitoring frequency for TSS is 1/Month for all facilities. The Nutrient General Permit was used to establish the monitoring frequencies for the nutrient parameters. The TRC monitoring frequency was requested by the permittee on July 1, 2010.

19. Basis for Sludge Use & Disposal Requirements: Chesterfield County currently contracts Nutri-Blend, Inc. to land-apply the sludge generated by the facility. The sludge meets Class B pathogen reduction. Applicable sludge requirements are addressed by the facility that receives the sludge.
20. Antibacksliding: With the exception of the ammonia and TSS concentration limitations, all limitations in the proposed permit are the same or more stringent than the limitations in the 2005 permit. The ammonia concentration limitations are now expressed to the number of significant digits in the underlying water quality standard, taking the analytical analysis constraints into consideration (i.e. lab methods cannot reach the thousandth's place, 0.001 mg/L); the TSS monthly average concentration was 10.7 mg/L and is now expressed in two significant digits. As the limitations themselves have not changed, merely the expression of those limits, antibacksliding has not been violated.
21. Compliance Schedules  
Revisions to the water quality standard regulations led to a new DO limitation. As this is a more restrictive effluent limitation, it is appropriate to allow a period of time for the permittee to achieve compliance. However, the facility is already complying with the newly established permit limit so no additional time is needed to achieve compliance. Consequently, a compliance schedule for DO was not given.
22. Additional Limitations and Monitoring Requirements – Part I.B.  
Required by Sewage Collection and Treatment Regulations, 9VAC25-790 and Virginia Water Quality Standards 9 VAC 25-260-170, bacteria; other recreational waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This special condition ensures proper operation of chlorination equipment to maintain adequate disinfection.  
  
The TRC minimum of 0.60 m/L was established to demonstrate an adequate bacterial kill; the alternative language, which allows bacteria testing within 15 minutes of a TRC value <0.60 mg/L, gives the facility flexibility in demonstrating that a sufficient bacterial kill has occurred. Additionally, the agency and facility do not have to address any inconsequential violations of this limitation.
23. Special Conditions  
Part I.C.1: 95% Capacity Reopener  
Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 4 for all POTW and PVOTW permits.  
  
Part I.C.2: O&M Manual Requirement  
Rationale: Required by Code of Virginia §62.1-44.19; Sewage Control and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190 E.  
  
Part I.C.3: Licensed Operator Requirement



Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 C and the Code of Virginia § 54.1-2300 et seq., Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.), require licensure of operators.

Part I.C.4: Reliability Class

Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities.

Part I.C.5: Sludge Use and Disposal

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 P, 220 B 2, and 420 through 720; and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal.

Part I.C.6: Sludge Reopener

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-220 C for all permits issued to treatment works treating domestic sewage.

Part I.C.7: Compliance Reporting

Rationale: Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limitation or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

Part I.C.8: Materials Handling/Storage

Rationale: 9 VAC 25-31-50 A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and 62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

Part I.C.9: Reopeners

Rationale:

- a. Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.
- b. 9 VAC 25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.
- c. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

Part I.C. 10: Indirect Dischargers

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 1 and B 2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

Part I.C. 11: CTO, CTC Requirement

Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790. 9 VAC 25-40-70.A authorizes DEQ to include technology-based annual concentration limitations in the permits of facilities that have installed nutrient control technology, whether by new construction, expansion, or upgrade.

Part I.C.12: Nutrient Reporting Calculations

Rationale: §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this definition is carried forward in 9 VAC 25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, this special condition is intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.

**Part I.C.13: Suspension of Annual Average Concentration Limitations for E3/E4 Facilities**

Rationale: 9 VAC 25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

**Part I.C.14: Effluent Monitoring Frequencies**

Rationale: Permittees are granted a reduction in monitoring frequency based on a history of permit compliance. To remain eligible for the reduction, the permittee should not have violations related to the effluent limits for which reduced frequencies were granted. If permittees fail to maintain the previous level of performance, the baseline monitoring frequencies should be reinstated for those parameters that were previously granted a monitoring frequency reduction.

**Part I.C.15: Closure Plan**

Rationale: Code of Virginia § 62.1-44.19 of the State Water Control Law. This condition establishes the requirement to submit a closure plan for the wastewater treatment facility if the treatment facility is being replaced or is expected to close.

**Part I.D: Pretreatment**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-730 through 900, and 40 CFR part 403 require certain existing and new sources of pollution to meet specified regulations.

**Part I.E: Whole Effluent Toxicity (WET) Monitoring Program**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-210 and 220 I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. See **Attachment I** for the WET evaluation.

**Part I.F and Part I.G—Sewage Sludge Land Application Limitations and Monitoring Requirements**

Rationale: VPDES Permit Regulation, Part VI-Subpart B.

**Part II, Conditions Applicable to All VPDES Permits**

The VPDES Permit Regulation at 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

24. Changes to Current Permit: Table 3: Part I.A.1

Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change	Date
	From	To	From	To		
Orthophosphate, Total Nitrogen, TKN, Nitrate-Nitrite	NL	-	1/Week	-	Monitoring was deleted in the 2007 permit authorized change to account for the new nutrient monitoring schema of the nutrient	6/2010

Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change	Date
	From	To	From	To		
All nutrient loading parameters (except for Total Phosphorus)	NL	-	1/Month or 1/ Year	-	general permit and in response to nutrient policy changes.	6/2010
DO Minimum	5.9 mg/L	6.0 mg/L	1/Day	4/Week	The monitoring frequency was revised in accordance with the performance-based monitoring evaluation.  The limitation was revised to address the revised Water Quality Standards (9 VAC 25-260-185). While this limitation is more stringent than required by the various regulations, this approach minimizes the chance of reporting errors.	6/2010
TRC	-	-	1/Day	12/ Day	Revised per July 1, 2010 permittee comment letter	7/2010
<i>E.coli</i>	-	126 N/100 mL	-	4/Month	40 CFR 122.44(d)(1)(iii); new agency policy in response to EPA comments  Previously, minimum TRC concentrations in the chlorine contact tank served as a surrogate to indicate an adequate bacterial kill; this surrogacy is no longer acceptable. However, it is presumed that no additional equipment or plant modifications are necessary to demonstrate compliance with this limitation; therefore, no compliance schedule was given.	6/2010
Ammonia – monthly average	4.3 mg/L 6.2 mg/L	4.26 mg/L 6.22 mg/L	-	-	The concentration limitations were revised in accordance with GM06-2016 with respect to the number of significant digits in the underlying water quality base; see #18 above.	6/2010
Ammonia - weekly average	5.7 mg/L 8.5 mg/L	5.78 mg/L 8.55 mg/L	-	-		
cBOD <sub>5</sub>	7.1 mg/L 10.7 mg/L 16.0 mg/L	7 mg/L 11 mg/L 16 mg/L	-	-	The concentration limitations were revised in accordance with GM06-2016 with respect to the precision of the applicable test method and to be consistent with the precision of the QL required in Part I.C.7; see #18 above.	7/2010
TSS	10.7 mg/L 16.0 mg/L	11 mg/L 16 mg/L	-	-	The concentration limitations were revised in accordance with GM06-2016 with respect to the number of significant digits.	6/2010

Part I.A.2 of the permit is new and was not included in the current permit; therefore, a change table is not necessary.

Table 4: Part I.B-G

From	To	Special Condition Changed	Reason for Change	Date
Cover page	Cover page	-	Revised in accordance with current regulations and DEQ policy; specifically, the formatting, and special standards were revised.	6/2010
Part I.A.1	Part I.A.1	Preamble	Revised due to current plans to install nutrient removal technology; a PER for this upgrade has been submitted	6/2010
Part I.A.1.a.(1)	Part I.A.1.a.(1)	Design flow	Revised for clarity	6/2010
Part I.A.1.a.(3)	Part I.A.1.a.(2)	Nutrient Monitoring and Limitations	Revised to reflect additional nutrient-related special conditions (GM07-2008, Amd 2)	6/2010
	Part I.A.1.a.(3)	WGP Coverage	New, reflects current agency policy conditions (GM07-2008, Amd 2)	6/2010
	Part I.A.1.a.(5) & (6)	Significant digits	New, reflects current agency policy (GM06-2016)	6/2010
	Part I.A.1.a.(7)	TRC Sampling	New, reflects permittee comments on the draft permit and DEQ accommodations (See Attachment K)	7/2010
	Part I.A.2	Nutrient Upgrade Tier	New, reflects the permittee's intentions to upgrade the plant per the submitted PER; this addition negates the need to modify the permit to include the appropriate nutrient limitations once the CTO for the upgrade is granted.  New limitations were included to address new nutrient regulations (i.e. 9 VAC 25-720 and 820)	6/2010
Part I.A.2	Part I.A.3	Sewage Sludge Limitations and Monitoring Requirements	Definitions of "NA" and "1/2 Months" added; 3.e was added for clarity	6/2010
Part I.B.	Part I.B.	TRC Limitations and Monitoring Requirements	Revised to reflect permittee comments on the draft permit (See Attachment K).  Specialized permit language was included in B.2 to simplify the permit terms and reduce redundancy should chlorination not be utilized as the mode of disinfection. The continuation of this customized special condition language was requested by the permittee on May 5, 2010, and DEQ is accommodating this request due to the facility being a VEEP participant at the E3 level.  The bacteria references in Part I.B.2 were revised from 235 N/100 mL to 126 N/100 mL to reflect changes in the WQS regulations.	7/2010
Part I.C.1	Part I.C.1	95% Capacity Notification	No changes	6/2010
Part I.C.3	Part I.C.2	O & M Manual	Revised to reflect January 27, 2010 Permit Manual	6/2010
Part I.C.4	Part I.C.3	Licensed Operator	No changes	6/2010
Part I.C.5	Part I.C.4	Reliability Class	No changes	6/2010

<b>From</b>	<b>To</b>	<b>Special Condition Changed</b>	<b>Reason for Change</b>	<b>Date</b>
Part I.C.6	Part I.C.5	Sludge Use and Disposal	Revised to reflect January 27, 2010 Permit Manual	6/2010
Part I.C.7	Part I.C.6	Sludge Reopener	No changes	6/2010
Part I.C.8	Part I.C.7	Compliance Reporting	Revised to reflect January 27, 2010 Permit Manual; the language deviates slightly from the manual in order to be more concise and less redundant.	6/2010
Part I.C.9	Part I.C.8	Materials Handling/Storage	No changes	6/2010
Part I.C.11 Part I.C.12	Part I.C.9	Reopeners	Revised to reflect GM07-2008, Amendment 2	6/2010
Part I.C.2	Part I.C.10	Indirect Dischargers	Revised; the last sentence referencing the Pretreatment Program was removed to reflect agency guidance (January 27, 2010 Permit Manual)	6/2010
Part I.C.10	Part I.C.11	CTC, CTO Requirement	Reflects January 27, 2010 Permit Manual and GM07-2008, Amendment 2  The Nutrient Reporting calculation varies from guidance in that it clarifies where the monthly average concentrations are reported (i.e. the nutrient general permit DMR).	6/2010
Part I.C.13	Part I.C.12	Nutrient Reporting Calculations		6/2010
-	Part I.C.13	Annual Average Concentrations		6/2010
Part I.C.16	Part I.C.14	Effluent Monitoring Frequencies	Revised to update parameters and frequencies	6/2010
	Part I.C.15	Closure Plan	New, reflects PRO Staff Decisions (December 2, 2008)	6/2010
Part I.D	Part I.D	Pretreatment	<p>Revised per January 27, 2010 Permit Manual and PRO boilerplate</p> <p>Specifically, Parts I.D: 2.a(1), 2.a(9), 2.e, 2.j, 5.a, 5.c, 7, 8, 10, 11, 12, 13, and 14 were revised to clarify reporting time frames, requirements, and deadlines and to address non-discharging pretreatment facilities. Additionally, acronyms were spelled out with their first use.</p> <p>With the exception of the annual report (which requires an original signature), electronic submittals of pretreatment requirements are preferred.</p> <p>Additional changes were made in response to permittee comments (See Attachment K)</p>	7/2010
Part I.E	Part I.E	Whole Effluent Toxicity	Revised per D. Debiasi (CO). The new testing endpoints do not constitute backsliding as the endpoints aren't criteria; while the endpoints are used to evaluate the data, they are not limitations and are not used as a "pass/fail" type of point. Even if the permittee meets the endpoints specified, a limitation may be needed and it may not be that endpoint.	6/2010
Part I.F	Part I.F	Sludge Records	Updated to reflect changes in the special condition numbering	6/2010
Part I.G	Part I.G	Sludge Reporting		6/2010

From	To	Special Condition Changed	Reason for Change	Date
Part I.A.1.a.(2)	[deleted]	Total Nitrogen calculation	Removed as Total Nitrogen monitoring is not required under Part I.A.1.	6/2010
Part I.A.1.c	[deleted]	Sampling Location	Removed as this condition is not included in DEQ guidance and the compliance point/sampling location is defined in the O&M Manual.	6/2010
Part I.C.14	[deleted]	Basis of Design	Removed in accordance with GM07-2008, Amendment 2	6/2010
Part I.C.15	[deleted]	Interim Optimization Plan		
Part I.C.17	[deleted]	General Permit Controls		

25. Variances/Alternate Limits or Conditions: None.

26. Public Notice Information required by 9 VAC 25-31-280 B:

Comment period: Publishing Newspaper: *Richmond Times-Dispatch*  
Publication Dates: July 30, 2010 and August 6, 2010  
Start Date: July 30, 2010 End Date: August 30, 2010

All pertinent information is on file and may be inspected or copied by contacting Gina Kelly at:

Virginia Department of Environmental Quality (DEQ)  
Piedmont Regional Office  
4949-A Cox Road  
Glen Allen, Virginia 23060-6296  
  
Telephone Number: 804/527-5048  
Facsimile Number: 804/527-5106  
Email: Virginia.Kelly@deq.virginia.gov

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at the DEQ Piedmont Regional Office by appointment.

Public Notice Comments: The Richmond Regional Planning District Commission (RRPDC) received one "no comment" response from Chesterfield County.  
No other comments were received during the public comment period.  
VDH had no objections to the draft permit.

27. Additional Comments:

a. Previous Board Action: None.

b. Staff Comments:

- Performance-based monitoring reduction was reevaluated with this permit reissuance (see **Attachment J**). The permit manual suggests that reduced monitoring is not appropriate when a facility has received a Warning Letter, Notice of Violation, etc during the previous three years. Although the permittee received a Warning Letter in May 2008 for TSS exceedences, the facility is a participant in the Virginia Environmental Excellence Program (VEEP) at the Exemplary Environmental Enterprise (E3) level and is therefore eligible for associated regulatory flexibility. Given the facility's performance, ammonia and cBOD<sub>5</sub> continue to qualify for reduced monitoring frequencies; additionally, DO qualified for reduced monitoring, using the new limitation for the evaluation.

While the DO limitation is becoming more stringent, the minimum DO reported in the past three years is 0.7 mg/L above the new DO limitation, and the long term average for this parameter is 59.3% higher than the new limitation. The permit manual does not prohibit the application of reduced monitoring to parameters with more stringent limitations, so long as they facility has a documented record of compliance. Accordingly, reduced monitoring is appropriate and was granted for this parameter.

As per the June 2003 Water Permit Managers' Meeting Minutes, the baseline monitoring frequency for TSS is 1/Month for all facilities, effectively applying reduced monitoring; no additional reduction is applicable at this time.

The Proctors Creek facility is not modifying the primary clarifiers, secondary clarifiers, advanced wastewater treatment tanks, or post aeration tanks; the facility is enhancing the existing activated sludge process by increasing the surface area of the film which maintains the biologically active organisms. An external carbon source, such as methanol, will be added to the BNR process to enhance denitrification. No projects that would enhance phosphorus removal are currently planned for this facility. As discussed and decided in the Water Permit Managers' February 2008 conference call, reduced monitoring may be maintained at a facility which is undergoing an enhancement of treatment. Accordingly, these reductions are applicable at both the current facility and the upgraded facility.

- This facility discharges to a receiving stream section with the special standards "a," "z," and "bb." The facility does not discharge to shellfish waters, therefore, special condition a" does not apply. Because the location of outfall 001 is not within the designated boundaries, special standard "z" does not apply. Special standard "bb" involves chlorophyll a; the nutrient general permit and Richmond Crater WQMP allocations adequately address chlorophyll a concerns.
- Financial assurance does not apply to this facility because it is a POTW.
- A registration statement for the nutrient general permit has been received and the associated general permit issued. Chesterfield County has elected to combine (i.e. "bubble") the allocated loads for the Proctor's Creek and Falling Creek WWTPs as allowed under the WGP.
- GM07-2008, Amd.2 suggests the inclusion of the Watershed General Permit special condition in permits where the former Nutrient Enriched Waters (NEW) policy was in effect; the special condition waives the mass loading limitations previously established. While this permit has a TP limitation of 2.0 mg/L based on the NEW policy, no mass loading limitation was established (i.e. monitoring only was required for mass load).

Consequently, this special condition is not applicable to this permit and therefore, was not included.

- In accordance with an email received from CO staff on April 24, 2008, Part I.E.2 was revised to require only one copy of the WET test be submitted with the original; two copies (as per GM 00-2012) are no longer necessary.
- Discharges associated with exposure to industrial stormwater at this site are addressed via VAR051394.
- The discharge is in conformance with the existing planning documents for the area.

28. 303(d) Listed Segments (TMDL): This facility discharges directly to the James River. The James River stream segment receiving the effluent is listed for not supporting the Recreation, Aquatic Life, and Fish Consumption Uses in Category 5A of the 2008 approved 303(d) list; the wildlife use was fully supporting in the 2008 cycle, and the Migratory Spawning Subuse was not assessed. The segment is listed as impaired for *E. coli*, Submerged Aquatic Vegetation (SAV), chlorophyll a, and PCBs. See Attachment C for additional details regarding the assessment, impairments and TMDL fact sheets.

As the facility has disinfection practices in place as well as *E. coli* limitations, the facility should not cause or contribute to the bacteria impairment. The facility has provided analytical data indicating the absence of PCBs in the effluent.

With respect to PCBs and *E. coli*, TMDLs have not been prepared or approved for the segment. This permit has a monthly geometric mean limitation of 126 N/100 mL for *E. coli* that requires compliance with the standard prior to discharge. Given these limits this facility can neither cause nor contribute to the observed violation of the standards. No limit for PCBs is included in this permit because data using the ultra-low detection level (Method 1668B) has not been provided to demonstrate that a limitation is necessary at this time.

Per the 2008 Impairment Factsheets, it is not anticipated that TMDLs will be completed for the SAV and chlorophyll a impairments as the impairments are being addressed via other means. However, the permit has a minimum DO limitation which addresses the SAV impairment and nutrient limitations which address the chlorophyll a impairment.

The permit also contains a re-opener condition that may allow these limits to be modified, in compliance with section 303(d)(4) of the Act once a TMDL is approved.

29. Summary of attachments to this Fact Sheet:

Attachment A	Facility Diagram
Attachment B	Location Map
Attachment C	Ambient Data
Attachment D	Site Visit
Attachment E	Effluent Data
Attachment F	Effluent Limitation Analysis
Attachment G	Richmond Crater Water Quality Management Plan
Attachment H	PER Summary Documents
Attachment I	WET Testing Evaluation and Memorandum
Attachment J	Reduced Monitoring Evaluation
Attachment K	Permittee Comments on Draft Permit and DEQ Response